

...2016 Spring [Flood](#) and Water Resources Summary and [Outlook](#)...

This is the second of two planned Spring [Flood](#) and Water Resources Outlooks for the Quad Cities [Hydrologic Service Area](#), which covers portions of eastern Iowa, northwest and west central Illinois, and extreme northeast Missouri. This includes the Mississippi River and its tributaries from above Dubuque, Iowa to below Gregory Landing, Missouri. The primary tributary river basins include the Maquoketa, Wapsipinicon, Cedar, Iowa, Skunk, and Des Moines Rivers in Iowa; the Fox River in Missouri; and the Pecatonica, Rock, Green, and La Moine Rivers in Illinois. This [outlook](#) is for the time period from early March through early June.

...There is an Elevated Risk for Flooding this Spring...

Much of the area will have near to above [normal](#) chances for flooding this season, but chances will be dependent on spring rains rather than snowmelt.

Mississippi River - near to above [normal](#)

Mississippi River Tributaries across Iowa - above [normal](#)

Mississippi River Tributaries across Illinois and Missouri - near to above [normal](#)

*** [Flood Outlook](#) Summary ***

In this updated Spring [Flood Outlook](#), changes to ongoing conditions have been minimal since mid-February, so the overall threat for spring flooding has not changed.

Wet conditions in the late fall and early winter periods have driven the factors for the increased risk for spring flooding in 2016 as streamflows remain above [normal](#) and soils are nearly saturated area-wide. With these conditions, snowmelt from additional snows and any [rainfall](#) will turn into [runoff](#), rather than soaking into the soils. In addition, with rivers already running high, it will take less [runoff](#) to reach [flood](#) stages. The higher potential for flooding is in place, regardless of the [snowpack](#) being below [normal](#).

NOTE: A heightened risk for flooding is not an indicator of severity. The highest probabilities are for widespread minor to moderate flooding.

Many factors are considered when determining the overall [flood](#) risk for the season, with the combination of these influences factoring into the final determination. The factors are discussed in detail below.

.Seasonal Precipitation: Above [Normal](#)

November and December were very warm and wet as record precipitation was measured across much of Iowa, Illinois, and Missouri. Warm conditions led to a majority of this precipitation falling as rain rather than snow, with some areas receiving [rainfall](#) amounts in excess of 5 inches above [normal](#) through this time period. Despite having near to below [normal](#) precipitation across the region for January and February, amounts have been well above [normal](#) for the winter as a whole.

.Snow Cover and Liquid Water Content: Below [Normal](#)

Snowfall has been below [normal](#) for much of the Upper Mississippi River [Basin](#) this winter season. The exception was across central and northeast Iowa where several [heavy snow](#) events tracked, leaving seasonal amounts up to 15 inches above [normal](#). As of early March, [snowpack](#) and any liquid content was minimal both locally and across much of the region. Where a [snowpack](#) does remain over the northern parts of the Mississippi

River Basin across northern Minnesota and Wisconsin, amounts were below normal, with liquid content averaging between 2 and 6 inches.

Although additional snowfall this season is possible, the likelihood for developing a deep snowpack is low.

.Soil Conditions: Much Above Normal

The high precipitation amounts that fell in late 2015 allowed for the saturation of soils and rapid recharge of the groundwater. Although the soil moisture content has decreased slightly in the past few months due to the drier pattern across the area, all of the Upper Mississippi River Basin remains well above normal with rankings above the 90th percentile for soil moisture. Therefore, soils are nearly saturated and not able to hold much additional moisture.

.Frost Depth: Near to Below Normal

The warm start to the winter kept the ground from developing a deep frost. Colder conditions did occur in January and February to lead to the freezing of the ground. As of early March, frost depths are generally less than a foot, with deeper frost depths across the northern parts of Minnesota and Wisconsin. With a warm weather pattern forecast through the remainder of March, it is likely that the frost will be steadily thawing.

.River Conditions: Above Normal

Streamflows are high for this time of year. In late December, the majority of local rivers were running at historically high levels. Although there has been a decline in flows over the past few months, levels remain well above normal. Rivers across Iowa are running in the 50th to 95th percentile for this time of year, with rivers over northeast Missouri and western and north central Illinois in the 50th to 75th percentile range. The Mississippi River is also running at high levels, around the 80th to 90th percentile.

.Ice Jam Flooding: Below Normal

There is low potential for ice jam flooding as most rivers are ice-free and an above normal temperature pattern should preclude additional ice formation on the rivers.

.Drought...

The entire Upper Mississippi River Basin is free of drought conditions as of early March.

.Weather Outlooks...

The outlook for precipitation and temperatures through May suggests higher chances for above normal temperatures throughout the Upper Mississippi River Basin. There are equal chances for above, near, or below normal precipitation for March, and through the May time-frame areas across the Great Lakes region through northern Illinois have higher chances for below normal precipitation, with equal chances for above, near, and below normal for the remainder of the area.

.Numerical River Outlooks...

This outlook is divided into three parts, the first part for the probabilities of minor, moderate and major flooding, the second part for high water and the final part for low water.

In Table 1 below, the current (CS) and historical (HS) or normal probabilities of exceeding minor, moderate and major flood stages are listed for the valid time period.

CS values indicate the probability of reaching a flood category based on current conditions.

HS values indicate the probability of reaching a flood category based on historical or normal conditions.

When the value of CS is greater than HS, the probability of exceeding that level is higher than normal. When the value of CS is less than HS, the probability of exceeding that level is lower than normal.

...Table 1--Probabilities for minor, moderate and major flooding...
Valid Period: 03/06/2016 - 06/04/2016

				: Current and Historical : Chances of Exceeding : <u>Flood</u> Categories : as a Percentage (%)					
				: <u>Categorical</u>					
				: <u>Flood</u> Stages (<u>ft</u>)					
				Minor		Moderate		Major	
Location	Minor	Mod	Major	CS	HS	CS	HS	CS	HS
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:Mississippi River									
Dubuque LD11	16.0	17.0	20.5	: 16	44	13	35	<5	10
Dubuque	17.0	18.0	21.5	: 22	51	15	41	<5	11
Bellevue LD12	17.0	18.0	20.0	: 13	32	11	20	<5	10
Fulton LD13	16.0	18.0	20.0	: 21	50	12	26	<5	10
Camanche	17.0	18.5	20.5	: 16	41	12	28	<5	11
Le Claire LD14	11.0	12.0	13.5	: 20	48	14	32	7	14
Rock Island LD15	15.0	16.0	18.0	: 36	57	24	47	12	19
Ill. City LD16	15.0	16.0	18.0	: 33	56	23	45	11	20
Muscatine	16.0	18.0	20.0	: 43	61	22	45	11	18
New Boston LD17	15.0	16.5	18.5	: 49	62	24	50	14	25
Keithsburg	14.0	15.5	17.0	: 48	62	33	49	15	25
Gladstone LD18	10.0	12.0	14.0	: 51	62	28	47	13	21
Burlington	15.0	16.5	18.0	: 48	62	32	46	17	26
Keokuk LD19	16.0	17.5	19.0	: 22	35	17	24	10	11
Gregory Landing	15.0	18.0	25.0	: 59	65	31	39	<5	<5
:Maquoketa River									
Manchester Hwy 20	14.0	17.0	20.0	: 19	21	14	14	7	7
Maquoketa	24.0	26.0	28.5	: 16	20	6	13	<5	8
:Wapsipinicon River									
Independence	12.0	13.0	15.0	: 11	13	8	8	7	7
Anamosa Shaw Rd	14.0	15.5	19.0	: 24	28	19	22	8	9
De Witt 4S	11.0	11.5	12.5	: 76	68	68	66	27	31
:North Skunk River									
Sigourney	16.0	18.0	21.0	: 49	55	28	40	5	11
:Skunk River									
Augusta	15.0	17.0	20.0	: 47	44	22	31	10	13
:Cedar River									
Vinton	15.0	18.0	19.0	: 12	23	5	8	<5	7
Cedar Rapids	12.0	14.0	16.0	: 16	28	8	16	6	9
Conesville	13.0	15.0	16.5	: 63	56	16	30	6	9
:Iowa River									
Marengo	14.0	15.5	18.5	: 82	74	67	63	<5	5
Iowa City	22.0	23.0	25.0	: <5	8	<5	7	<5	<5
Lone Tree	15.0	16.5	18.0	: 12	24	9	15	<5	9

Columbus Jct	19.0	22.0	23.0	:	52	55	17	23	11	15
Wapello	20.0	22.0	25.0	:	64	60	32	44	11	13
Oakville	10.0	12.0	19.0	:	56	56	21	31	<5	<5
:English River										
Kalona	14.0	16.0	18.0	:	49	48	28	33	10	15
:Des Moines River										
Keosauqua	22.0	25.0	27.0	:	9	9	<5	<5	<5	<5
St Francisville	18.0	22.0	25.0	:	65	50	11	11	<5	<5
:Fox River										
Wayland	15.0	18.0	20.0	:	27	25	10	12	<5	<5
:Pecatonica River										
Freeport	13.0	14.0	16.0	:	39	41	21	18	<5	<5
:Rock River										
Como	10.0	11.0	12.0	:	43	46	28	28	21	18
Joslin	12.0	14.0	16.5	:	56	54	28	26	11	15
Moline	12.0	13.0	14.0	:	57	53	32	28	22	18
:Green River										
Geneseo	15.0	16.5	18.0	:	22	23	13	16	9	9
:La Moine River										
Colmar	20.0	22.0	24.0	:	77	72	56	51	26	23

Legend

CS = Conditional Simulation (Current [Outlook](#))

HS = Historical Simulation

[ft](#) = Feet

In Table 2 below, the 95 through 5 percent columns indicate the [probability](#) of exceeding the listed stage levels ([ft](#)) for the valid time period.

...Table 2--Exceedance Probabilities...

Location	Chance of Exceeding Stages at Specific Locations						
	Valid Period: 03/06/2016 - 06/04/2016						
	95%	90%	75%	50%	25%	10%	5%

:Mississippi River							
Dubuque LD11	9.2	9.9	12.0	13.4	15.2	18.6	19.2
Dubuque	11.2	11.7	13.5	14.9	16.9	20.2	20.8
Bellevue LD12	9.9	10.5	12.0	13.2	14.9	18.0	18.6
Fulton LD13	9.8	10.2	11.9	14.0	15.5	18.8	19.3
Camanche	11.9	12.2	13.2	14.7	16.0	19.6	20.2
Le Claire LD14	7.4	7.9	8.6	9.7	10.6	13.3	14.1
Rock Island LD15	10.3	10.9	12.0	14.1	15.7	18.7	19.4
Ill. City LD16	9.1	10.0	11.8	13.7	15.3	18.8	19.8
Muscatine	10.9	11.7	13.3	15.4	17.1	20.5	21.3
New Boston LD17	10.8	11.7	13.2	14.9	16.3	19.9	20.8
Keithsburg	11.4	11.6	12.8	13.9	16.2	18.4	19.0
Gladstone LD18	7.1	7.5	8.8	10.0	12.6	15.0	15.9
Burlington	12.4	12.7	13.9	14.8	17.4	19.3	20.1
Keokuk LD19	8.8	9.2	10.9	12.0	15.5	18.9	19.5
Gregory Landing	11.3	11.7	13.7	15.8	18.6	21.4	22.2
:Maquoketa River							
Manchester Hwy 20	6.6	7.3	8.3	9.9	13.1	19.5	21.0

Maquoketa	13.4	14.0	15.4	17.8	20.5	25.5	27.7
:Wapsipinicon River							
Independence	6.2	6.5	7.1	7.9	8.9	12.1	16.6
Anamosa Shaw Rd	8.4	9.2	10.4	11.9	13.7	18.7	22.4
De Witt 4S	9.0	9.4	11.3	12.0	12.6	13.2	13.4
:North Skunk River							
Sigourney	6.1	8.2	13.6	15.9	18.3	20.0	21.4
:Skunk River							
Augusta	4.6	6.2	9.8	14.2	16.5	20.1	22.5
:Cedar River							
Vinton	8.3	8.7	10.6	12.1	13.8	15.2	18.0
Cedar Rapids	6.9	6.9	7.7	9.2	11.2	13.5	17.3
Conesville	12.0	12.0	12.3	13.6	14.7	15.5	16.9
:Iowa River							
Marengo	12.7	13.4	15.0	16.2	17.0	18.0	18.5
Iowa City	16.2	16.2	16.7	18.8	19.4	19.5	20.2
Lone Tree	10.9	11.3	12.5	13.9	14.5	15.8	17.9
Columbus Jct	16.8	16.8	17.4	19.1	20.7	23.8	25.0
Wapello	18.2	18.2	19.1	20.9	22.4	25.5	26.6
Oakville	7.9	7.9	8.7	10.5	11.5	14.7	15.7
:English River							
Kalona	6.0	7.7	11.7	14.0	16.1	17.9	19.1
:Des Moines River							
Keosauqua	15.6	15.8	17.8	19.2	20.3	21.8	22.3
St Francisville	14.2	14.4	17.0	18.7	20.3	22.3	23.3
:Fox River							
Wayland	4.2	5.9	9.5	12.3	15.1	18.2	19.3
:Pecatonica River							
Freeport	9.3	10.5	11.0	12.6	13.8	14.6	15.3
:Rock River							
Como	6.0	6.5	7.6	9.4	11.8	12.8	14.6
Joslin	8.2	9.1	10.4	12.4	14.6	16.6	18.4
Moline	9.6	10.1	11.0	12.1	13.8	14.8	16.6
:Green River							
Geneseo	5.7	6.5	9.2	12.4	14.7	17.6	20.5
:La Moine River							
Colmar	12.5	16.1	20.2	22.6	24.3	25.6	26.2

In Table 3 below, the 95 through 5 percent columns indicate the [probability](#) of falling below the listed stage levels ([ft](#)) for the valid time period.

...Table 3--Non-Exceedance Probabilities...

Location	Chance of Falling Below Stages at Specific Locations Valid Period: 03/06/2016 - 06/04/2016						
	95%	90%	75%	50%	25%	10%	5%
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:Mississippi River							
Dubuque LD11	7.9	7.7	6.8	5.9	5.0	4.6	4.4

Dubuque	10.2	10.0	9.2	8.4	7.9	7.6	7.4
Bellevue LD12	8.9	8.7	7.8	6.1	4.9	4.3	3.9
Fulton LD13	8.6	8.5	7.6	6.0	4.9	4.6	4.4
Camanche	11.1	11.0	10.3	9.5	9.1	8.9	8.8
Le Claire LD14	6.8	6.7	6.2	5.4	4.8	4.6	4.5
Rock Island LD15	9.5	9.1	8.2	6.7	5.5	4.9	4.4
Ill. City LD16	8.2	7.5	6.6	5.4	4.4	4.0	3.6
Muscatine	10.0	9.3	8.3	7.3	6.5	6.3	6.0
New Boston LD17	9.8	9.1	8.1	6.3	4.6	4.0	3.6
Keithsburg	10.5	10.1	9.2	7.7	6.4	5.9	5.6
Gladstone LD18	6.2	5.7	4.4	3.1	2.0	1.6	1.2
Burlington	11.7	11.3	10.4	9.3	8.3	8.0	7.7
Keokuk LD19	7.9	7.5	6.5	5.4	4.2	3.3	2.5
Gregory Landing	10.5	9.7	8.8	7.4	6.6	6.4	6.3
:Maquoketa River							
Manchester Hwy 20	4.3	4.3	4.1	4.0	3.9	3.8	3.7
Maquoketa	11.8	11.6	11.4	11.1	10.8	10.6	10.5
:Wapsipinicon River							
Independence	5.3	5.2	5.2	5.0	4.9	4.8	4.7
Anamosa Shaw Rd	6.6	6.3	5.8	5.6	5.4	5.1	5.0
De Witt 4S	7.2	6.8	6.4	6.1	5.7	5.3	5.1
:North Skunk River							
Sigourney	5.7	5.4	5.1	4.7	4.4	4.0	3.9
:Skunk River							
Augusta	3.7	3.4	3.0	2.6	2.1	1.7	1.6
:Cedar River							
Vinton	5.1	4.9	4.4	3.7	3.2	2.8	2.6
Cedar Rapids	4.8	4.7	4.5	4.1	3.9	3.7	3.6
Conesville	8.2	7.9	7.6	7.0	6.5	6.1	5.9
:Iowa River							
Marengo	9.0	8.6	8.1	7.5	7.1	6.6	6.4
Iowa City	11.6	11.3	10.9	10.7	9.6	9.1	9.1
Lone Tree	7.3	7.2	6.6	5.9	4.9	4.1	4.0
Columbus Jct	13.6	12.5	11.7	10.8	10.1	9.5	9.3
Wapello	14.8	13.6	12.9	12.1	11.4	10.6	10.4
Oakville	4.8	3.7	3.0	2.2	1.6	0.9	0.7
:English River							
Kalona	5.0	4.7	4.5	4.2	4.0	3.7	3.6
:Des Moines River							
Keosauqua	14.6	13.8	12.6	11.9	11.3	11.0	10.8
St Francisville	12.7	11.8	9.8	8.8	8.1	7.6	7.4
:Fox River							
Wayland	2.0	2.0	1.9	1.8	1.7	1.6	1.6
:Pecatonica River							
Freeport	7.6	6.7	6.1	5.2	4.6	4.3	4.1
:Rock River							
Como	5.5	5.2	4.8	4.2	3.6	3.4	3.2
Joslin	7.7	7.3	6.8	6.1	5.3	5.0	4.7
Moline	9.3	9.1	8.8	8.6	8.2	8.1	7.9
:Green River							
Geneseo	4.4	4.2	4.0	3.8	3.5	3.1	2.9

:La Moine River
Colmar

4.4 4.2 3.9 3.8 3.6 3.4 3.4

These long-range probabilistic outlooks contain forecast values that are calculated using multiple season scenarios from 30 or more years of climatological data, including current conditions of the river, soil [moisture](#), snow cover, and 30 to 90 day long-range outlooks of temperature and precipitation. By providing a range of probabilities, the level of risk associated with long-range planning decisions can be determined. These probabilistic forecasts are part of the National Weather Service's Advanced Hydrologic Prediction Service (AHPS).

Information in this [outlook](#) has been collected from [numerous](#) sources, including the United States Geological Survey (USGS), the US Army Corps of Engineers (USACE), the Midwestern Regional [Climate](#) Center (MRCC), the National [Drought](#) Monitor, [NOAA](#)'s [Climate](#) Prediction Center ([CPC](#)), and the National Operational Remote Sensing Center ([NOHRSC](#)).

Weather and water information, including the statistical data available in graphical format can be found at the following location: <http://www.weather.gov/dvn>. Additional information can be found at the North Central [River Forecast Center](#)'s website at: <http://www.crh.noaa.gov/ncrfc>.

This is the last Spring [Flood](#) and Water Resources [Outlook](#) for 2016. Regular long-range probabilistic outlooks will continue to be issued monthly and are typically issued near the end of the month.

Any questions concerning this outlook can be directed to:

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